Amendments to the Specification

Please replace the abstract with the following:

Abstract

A combination one or more species of ~~lactobacillus~~ *Lactobacillus* bacteria and one or more types of fibrolytic enzymes can be used to replace animal protein in cattle feed. The combination results in a better amino acid balance in the digestive tract of cattle resulting in a better utilization of nitrogen. Less water-soluble nitrogen compounds pass through the digestive tract resulting in less pollution. More nitrogen in the feed is converted to water insoluble compounds resulting in better feed utilization and less water-soluble pollution in the manure. The diseases carried by some animal protein additives, such as "mad cow" are not present in the additives of the present invention.

Please replace paragraph [0007] with the following amended paragraph:

[0007] In the book, The Secret Life of Germs, by Philip M. Tierno Jr., Ph.D., Simon & Shuster, (2001) page 139 it is disclosed, "With regard to human prion disease, or CJD, the thought of prions eating holes in your brain after thirty or forty years is frightening enough, surely. But in 1996 (CJD) began to kill British people in their late teens and early twenties. When these cases of variant CJD (vCJD) were ~~lie~~ tied to eating British beef the mad cow scare began in earnest. "You eat it. Then it eats you" was the message the media shrieked into the public's ear. Meanwhile the British authorities reacted slowly, delaying the implementation of a necessary temporary ban on the sale of British beef. Even after the ban went into effect, including a ban on the domestic sale of feed containing animal parts. The British government allowed that same feed to be exported to other countries, including the United States."

Please delete paragraph [0012] starting with U.S. Pat. No. 5,662,901---

Please delete paragraph [0013]

Please delete paragraph [0014]

Please replace paragraph [0018] with the following amended paragraph:

[0018] In an article entitled Fibrolytic enzymes for beef and dairy cows, David Hutcheson PhD., Animal Agricultural Consulting, Inc. PO Box 50367 Amarillo, Tex. 79159 discloses, "Fibrolytic enzymes increases dry matter digestibility, neutral detergent fiber digestion, organic ~~mater~~ matter, cellulose, hemicellulose and increase ruminal rates of microbial protein."

Please replace paragraph [0019] with the following amended paragraph:

[0019] U.S. Pat. No. 6,221,381 B1 Shelford (2001) discloses at the Abstract "Methods and compositions are provided for enhancing feed utilization efficiency in a ruminant animal by adding to the feed a sufficient amount of a nonionic surfactant to enhance the utilization of the feed by the animal.--A digestion enhancing enzyme and lactic acid bacteria inoculum may also be added to the feed." At col. 7, first paragraph, Shelford discloses "In addition to feed and a nonionic surfactant, the compositions of the invention may further comprise one or more additional agents that enhance the ruminant digestive processes. Such agents include, for example, pyrodoxal 5-phosphate, fumaric acid and its salts, sorbic acid and its salts, parabenzoic acid esters, benzoic acid, polydimethyl siloxane-polyethers, unsaturated alcohols, bentonite, proteolytic and/or carbohydrase enzymes, such as glycanase, hemicellase, cellulase, pectinase, xylanase and amylase, and lactic acid bacteria inoculants, such as those comprising Lactobacillus casei, L. acidophilus, L. salivarius, L. corymiformis subsp coryniformis, L. curvatus, L. plantarum, L. brevis, L. buchneri, L. fermentum, L. viridescens Pdiococcus acidilacti, P. cerevisiae, P. pentosaceus, Streptococcus faecalis, S. faecium, S. lactis, L. buchneri, L. fermentum, L. viridenscens, L. delbrueckiin, Leuconostoc cremoris, L. dextranicum, L. mesenteroides or L. citrovorum. Where the surfactant is used in conjunction with exogenous glycanases, the method of producing feed compositions in the ~~sent~~ present invention is most effective when surfactant constitute on the order of about 0.01% of the dry weight of the feed. In situations where the surfactant is used without exogenous enzymes, the compositions are most effective when the surfactant concentration does not exceed about 0.2%, of the dry weight of the feed."

Please replace paragraph [0021] with the following amended paragraph:

[0021] U.S. Pat. No. 5,876,990 Reddy et al (1999) discloses at the Abstract, "A first media provides an oxygen inducer such as catalase--. A second media provides an oxygen supplier such as a peroxide." The composition can also contain ~~ermines~~ enzymes and bacteria. At col. 29, Example 12, Reddy discloses, "This experiment evaluated the effect on growth, production, general well being, and reduction of mortality of adding oxy-prep and micro-prep to feed for beef cattle, dairy cattle, poultry, dogs, cats, and pigs. The micro-prep was prepared according to the procedure described under Composition of Micro-Prep, above. The following micro-organisms were grown individually: Lactobacillus acidophilus, Lactobacillus casei, Lactobacillus plantarum, Pedicoccus acidolactic, Lactococcus lactis var. lactis, Bifidobacterium bifidus, Lactococcus lactis var Lactis subspecies diacetyllactis, streptococcus faecium, Propionibacterium shermanii, Propionibacterium arabinosum and Propionibacterium zeae, Saccharomyces cerevisiae, Aspergillus oryza and Bacillus subtilus. At the end of the growth, the organisms were mixed together, forming a combined liquid culture. Ten gallons of the combined liquid culture was thoroughly mixed with the following ingredients to form a doughy mass: 1.0 pounds of lecithin, 0.1 pounds of sodium propionate, 2.0 pounds calcium carbonate, 2.0 pounds of multi-enzymes, 0.10 pounds of yucca schidigera extract (range 0.01 to 1 pound), 40 pounds of sodium bentonite (range 30 to 60 pounds), 20 pounds of rice flour (range 10 to 30 pounds), and 20 pounds of wheat flour. The pH of the mix was adjusted to 6.5 to 7.5 using sodium hydroxide or sodium bisulfate. The micro-prep was extruded in the form of small pellets. The extruded micro-prep was dried and milled to the consistency of the feed." At claim 6, the enzyme was disclosed as follows, "6. The media system of claim 5, wherein said pellet further comprises an enzyme selected from the group consisting of protease, lipase, amylase, cellulase, pectinase, glucose oxidase, galactose oxidase, lactase, and mixtures thereof."

Please replace paragraph [0022] with the following amended paragraph:

[0022] The present inventors market a product containing ~~lactobacillus~~ *Lactobacillus* and an enzyme system. The composition was a trade secret. The ratio of digestive enzyme units to colony forming units is estimated to be 6.8 digestive enzyme units to 10.sup.7 colony forming units based upon the input ingredients. The amount of enzyme per feeding was 2.7.times.10.sup.3 digestive units per oz. (28.3 g).

Please replace paragraph [0028] with the following amended paragraph:

[0028] The present invention is a cattle feed additive containing fibrolytic enzymes having enzyme activity and one or more species of ~~lactobacillus~~ *Lactobacillus* bacteria having colony forming units wherein the ratio of enzyme activity to colony forming units has a value of at least about 1 unit of digestive enzyme activity to every 10.sup.5 colony forming units. Preferably the cattle fed additive has a ratio of enzyme activity to colony forming units has a value of at least 2 units of enzyme activity to every 10.sup.6 colony forming units. Preferably the ~~lactobacillus~~ *Lactobacillus* bacteria are selected from the group comprising ~~Lactobacillus Acidophilus~~ *Lactobacillus acidophilus*, ~~Lactobacillus Plantarum~~ *Lactobacillus plantarum*, and ~~Lactobacillus Brevis~~ *Lactobacillus brevis*, and mixtures thereof. Preferably the fibrolytic enzymes are selected from the group comprising cellulases, xylanase, hemi-cellulase and mixtures thereof.

Please replace paragraph [0029] with the following amended paragraph:

[0029] The composition of the present invention can be free of surfactants and any other ingredients disclosed in the prior art to enhance the performance of enzymes and/or ~~lactobacillus~~ *Lactobacillus* bacteria.

Please replace paragraph [0030] with the following amended paragraph:

[0030] The method of making cattle feed of the present invention is characterized by replacing previously used bypass protein in the animal feed with a sufficient amount of a mixture of one or more specie of ~~lactobacillus~~ *Lactobacillus* bacteria and one or more types of fibrolytic enzymes, to produce at least enough microbial protein to be at least equivalent to one half pound (0.23 kg) of animal protein fed to each of the cattle per day, assuming that each of the cattle are mature and of an average weight for cattle. The preferred ~~lactobacillus~~ *Lactobacillus* bacteria are selected from the group consisting of ~~Lactobacillus Acidophilus~~ *Lactobacillus acidophilus*, ~~Lactobacillus Plantarum~~ *Lactobacillus plantarum*, and ~~Lactobacillus Brevis~~ *Lactobacillus brevis*, and mixtures thereof, and the protein byproducts replaced are selected from the group consisting of nerve, brain, blood, bone and meat containing byproducts. The preferred ~~lactobacillus~~ *Lactobacillus* bacteria are a mixture of Lactobacillus Acidophilus, Lactobacillus Plantarum, and Lactobacillus Brevis. The one or

more digesting enzymes are preferably selected, from the group consisting of xylanase, and cellulases derived from Trichoderma viride, Aspergillus oryzae, Aspergillus niger, and Bacillus subtilis. Preferably the one or more digesting enzymes are a mixture of xylanase, and cellulases derived from Trichoderma viride, Aspergillus oryzae, Aspergillus Niger, and Bacillus subtilis.

Please replace paragraph [0031] with the following amended paragraph:

[0031] The method of converting cattle feed to microbial protein in cattle of the present invention is also characterized by incorporating a sufficient amount of a mixture of one or more species of ~~lactobacillus~~ *Lactobacillus* bacteria and one or more types of digesting enzymes into cattle feed to form at least a sufficient amount of microbial protein to be at least equivalent to one ~~four~~ fourth pound (0.11 kg) of animal protein fed to each of the cattle per day. The ~~lactobacillus~~ *Lactobacillus* bacteria are preferably selected from the group consisting of ~~Lactobacillus Acidophilus~~ *Lactobacillus acidophilus*, ~~Lactobacillus Plantarum~~ *Lactobacillus plantarum*, and ~~Lactobacillus Brevis~~ *Lactobacillus brevis*, and mixtures thereof and the amount of microbial protein formed is at least equivalent to one half pound (0.23 kg) of animal protein fed to each of the cattle per day. The ~~lactobacillus~~ *Lactobacillus* bacteria are preferably a mixture of ~~Lactobacillus Acidophilus~~ *Lactobacillus acidophilus*, ~~Lactobacillus Plantarum~~ *Lactobacillus plantarum*, and ~~Lactobacillus Brevis~~ *Lactobacillus brevis* . The one or more digesting enzymes are preferably selected from the group consisting of xylanase, and cellulases derived from ~~Trichoderma viride~~ *Trichoderma viride*, ~~Aspergillus oryzae~~ *Aspergillus oryzae*, ~~Aspergillus niger~~ *Aspergillus niger*, and ~~Bacillus subtilis~~ *Bacillus subtilis*. One or more digesting enzymes are preferably a mixture of xylanase, and cellulases derived from ~~Trichoderma viride~~ *Trichoderma viride*, ~~Aspergillus oryzae~~ *Aspergillus oryzae*, ~~Aspergillus niger~~ *Aspergillus niger*, and ~~Bacillus subtilis~~ *Bacillus subtilis*.

Please replace paragraph [0035] with the following amended paragraph:

[0035] Ruminant Formula 40 AF contains a mixture of ~~Lactobacillus Acidophilus~~ *Lactobacillus acidophilus*, ~~Lactobacillus Plantarum,~~ *Lactobacillus plantarum*, and ~~Lactobacillus Brevis~~ *Lactobacillus brevis*. These are live, concentrated bacteria suspended in

a mixed sugar base. The bacteria are in a weight % ratio of ~~Lactobacillus Acidophilus~~ *Lactobacillus acidophilus* 60%, ~~Lactobacillus Plantarum~~ *Lactobacillus plantarum* 20%, and ~~Lactobacillus Brevis~~ *Lactobacillus brevis* 20%. The final concentration with the sugar base is blended to 80 billion cfu/gram with a guarantee of 40 billion cfu/gram. The bacteria were prepared according to the procedure of U.S. Pat. No. 4,226,940 Storrs (1980).

Please replace paragraph [0036] with the following amended paragraph:

[0036] M8C enzymes are a dried fermentation extract of ~~Bacillus subtilis~~ *Bacillus subtilis*, ~~Aspergillus oryzae~~ *Aspergillus oryzae*, ~~Trichoderma viride~~ *Trichoderma viride* and ~~Aspergillus niger~~ *Aspergillus niger*. M8C enzymes are a 50/50 mixture by weight of EX 28000 enzymes and Multicel 185 enzymes.

Please replace paragraph [0041] with the following amended paragraph:

[0041] EX 28000 enzymes product is a water dispersible blend of the extracts of ~~Bacillus subtilis~~ *Bacillus subtilis* and ~~Aspergillus oryzae~~ *Aspergillus oryzae*. The product includes high concentrations of alpha-amylase, beta-glucanase (gumase), and hemi-cellulase. The product has an Amylolytic Activity of 28,000 BAU/gram, a Betaglucanase Activity of 12,000 Betaglucanase units/gram and a Hemicellulase Activity of 900 Hemicellulase units/gram, Although a primary enzyme associated with ~~Bacillus subtilis~~ *Bacillus subtilis* exact is amylase, other useful hydrolases are often included in this product. These other enzymes catalyze the breakdown of complex carbohydrates other than starch. Hemicellulase activity attacks plant wall components. Beta-glucanase helps break down beta-linked glucose polymers often associated with grains, such as barley, oats, and wheat, and other products, including soy bean meal and locust bean gum. This additional digestive action is broadly classified as gumase activity. The presence of soluble calcium has a stabilizing effect on most enzymes of this type.

Please add the following new paragraph after paragraph [0051]:

[0051.1] TABLE-US-00006 TABLE 6 Nutrient Profile of Study Rations Parameter Control Diet PE Diet CPDM (%) (crude protein % dry matter) 17.8 16.7 Ruminal Undegradability (UIPIP) 38.1 33.3 Fat (%) 6.0 5.8 NDF (%) 31.3 32.1 eNDF (%)(neutral detergent fiber 21.8

22.4 effective) NSC (%) 39.7 38.7 Rumen Balance Peptide (% of requirement) 121 98 NH.sub.3 (% of requirement) 175 136 Amino Acid Balance Met (g) -3.7 -2.6 Met (% mp) 2.01 2.07 Lys (g) -38.4 -24.3 Lys (% mp) 6.2 6.81 Bacterial Yield CP (g/d) 2278.31 2676.34 Bacterial Growth Efficiency g Bact N/kg Ferment CHO 35.11 41.37

Please replace paragraph [0057] with the following amended paragraph:

[0057] .mu.=overall mean, ~~TABLE US-00006 TABLE 6 Nutrient Profile of Study Rations Parameter Control Diet PE Diet CPDM (%) (crude protein % dry matter) 17.8 16.7 Ruminal Undegradability (UIPIP) 38.1 33.3 Fat (%) 6.0 5.8 NDF (%) 31.3 32.1 eNDF (%)(neutral detergent fiber 21.8 22.4 effective) NSC (%) 39.7 38.7 Rumen Balance Peptide (% of requirement) 121 98 NH.sub.3 (% of requirement) 175 136 Amino Acid Balance Met (g) -3.7 -2.6 Met (% mp) 2.01 2.07 Lys (g) -38.4 -24.3 Lys (% mp) 6.2 6.81 Bacterial Yield CP (g/d) 2278.31 2676.34 Bacterial Growth Efficiency g Bact N/kg Ferment CHO 35.11 41.37~~